Unidirectional Na^+ Influx under Different Growth Stages of *Puccinellia tenuiflora* and Wheat

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Key words: isotope ($^{22}Na^+$) tracing technique, unidirectional Na^+ influx, growth stage, halophyte, glycophyte

Introduction Restricting unidirectional Na^+ influx into root was an important way to reduce the net accumulation of Na^+. However, there was no report regarding whether the unidirectional Na^+ influx was affected by the growth stage. Consequently, it was hard to compare the influxes between/among different growth stages or species. This study was focused on this problem. Thus, Gramineous halophyte *P. tenuiflora* and glycophyte wheat were chosen, for testing the unidirectional Na^+ influxes of seedlings at the 2 leaf, 3 leaf and 4 leaf stages in 25 and 100 mM NaCl treatments.

Materials and methods Seedlings of *P. tenuiflora* and wheat were germinated and then cultured in modified Hoagland's nutrient solution, and subsequently NaCl treated for 7 days after reaching the 2, 3 and 4 leaf stage. Seedlings were harvested and weighed. $^{22}Na^+$ influx was evaluated according to the method described by Essah et al. (2003).

Results With advancing plant growth (Figure 1), unidirectional Na^+ influx was increased significantly in both species, and more obvious in 100 mM NaCl (Figure 2). There was no significant difference between *P. tenuiflora* and wheat in 25 mM NaCl. But in 100 mM NaCl, *P. tenuiflora* had stronger ability than wheat to restrict the increase of unidirectional Na^+ influx in the 4 leaves stage.

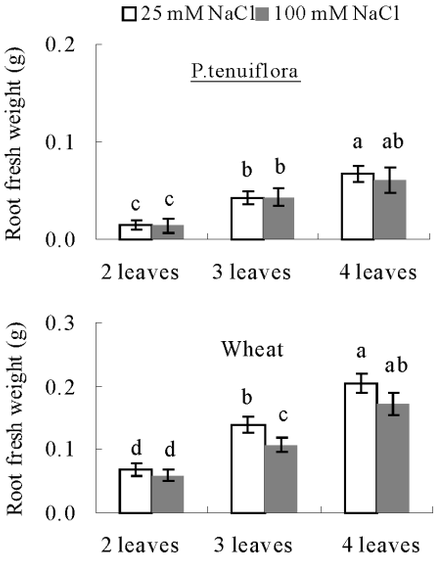

Figure 1 *Root fresh weight of* P. tenuiflora *and wheat at different growth stages (P < 0.05, Duncan test).*

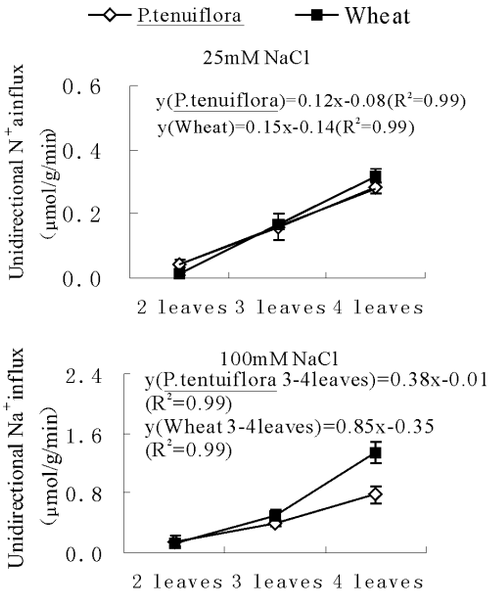

Figure 2 *Unidirectional Na^+ influx of* P. tenuiflora *and wheat at different growth stages treated with 25 and 100mM NaCl.*

Conclusions Unidirectional Na^+ influx was increased significantly with growth stage in both species, but more obvious in 100 mM NaCl. At the 2-3 leaf stage, the capacities of restricting Na^+ influx in both *P. tenuiflora* and wheat were similar, but significantly enhanced in *P. tenuiflora* after more mature (4 leaves). It was recommended that the growth stages should be taken into account when unidirectional Na^+ influxes were compared between/among different growth stages or species.

References

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